CLAIMS

1. A single crystalline thin film formed on an underlayer, wherein

said thin film is made of a substance different from that of said underlayer,

a specific atomic layer contained in common in said underlayer and said thin film is shared at an interface of said underlayer and said thin film, and

in a region as adjacent to the interface as 100 or fewer unit cells of the thin film apart from the interface, a ratio of crystalline regions having grown with an orientation of ± 2 degrees or less deviation angle on the basis of a crystal orientation of said underlayer is 50% or more.

2. The single crystalline thin film according to claim 1, wherein each of said thin film and said underlayer is made of a substance having a stacked-layer crystal structure.

3. The single crystalline thin film according to claim 1, wherein at least one of said thin film and said underlayer is made of an oxide including at least two kinds of metal elements.

4. The single crystalline thin film according to claim 1, wherein at least one of said thin film and said underlayer is made of a substance having a crystal structure of a perovskite type.

5. The single crystalline thin film according to claim 1, wherein a difference in lattice constant between said thin film and said underlayer is in a range of more than 5% and less than 15%.

6. The single crystalline thin film according to claim 1, wherein said thin film is

made of a $RE_{1+x}Ba_{2-x}Cu_3O_{7-y}$ based superconductor, where RE represents at least one kind of rare earth elements.

7. The single crystalline thin film according to claim 1, wherein said underlayer is made of $BaZrO_3$.

8. The single crystalline thin film according to claim 1, wherein said thin film shows superconductivity at a temperature higher than 91 K.

9. The single crystalline thin film according to claim 1, wherein said interface has its interface energy of lower than 2 J/m^2.

10. The single crystalline thin film according to claim 9, wherein said interface energy is calculated by the first-principles calculation band method.